Professional MCDU box meets Open serious MOD

Combining HW MCDU unit to FlyByWire MCDU-server

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Hobbyist (Not representing any organization)

2022-6-9

Disclaimer

I will introduce various SW/HW components, however

- I am not representing any party who develops these components.
- Things introduced here is just a quick hack, and cannot be the reference.
- Implementation highly depends on my environment, may not portable.
- Of course, no guarantee, no support commitment, play with your own risk
- Component (product) name introduced here are registered trade mark of each vendors

Microsoft Flight Simulator 2020

Microsoft Flight Simulator 2020 (a.k.a. MSFS or MSFS2020)

Product brief summary

- Runs on Windows PC and Xbox
- Highly utilize resources on cloud
- Revived by Asobo Studio
- Includes various planes includes flight systems
- Can use 3rd party HW (joy-stick, rudder,..)
- Also, accept 3rd party plane model (as MOD)

Now MSFS becomes entire flight simulator execution platform

3rd party gaming device (common products)

Standard Windows game device

- USB HID class device
- Windows OS support natively
- Test program integrated to Control Panel
- No extra driver needed
- MSFS detects and works
- Mostly right out of the box experience

A320 PRO-MX MCDU

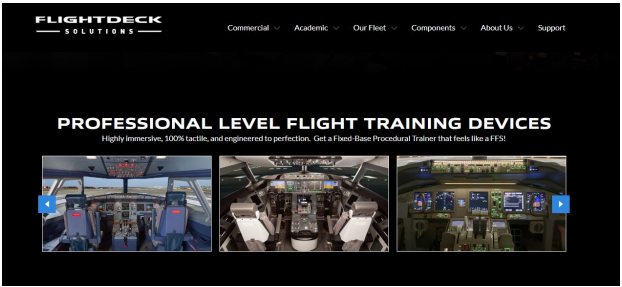
Flightdeck Solutions E-Series A320 PRO-MX MCDU

Multi-Function Control Display Unit

- Emulate Airbus MCDU HW
- Identical size, material, color
- HDMI interface (video input)
- Ethernet port (event input/output)
- Speak standard TCP/IP protocol
- Does not contain Flight Management and Guidance SW

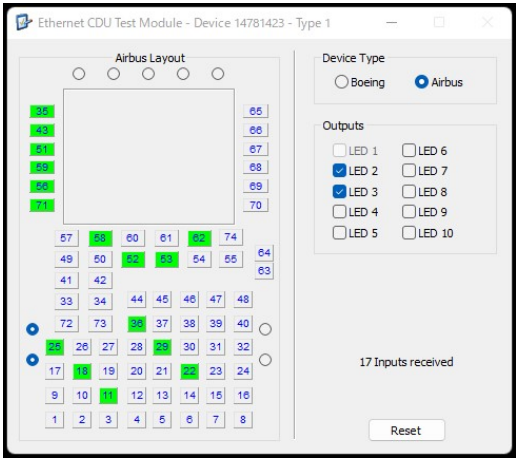
https://flightdecksolutions.com/components/p/fds-a320-pro-mx-mcdu-e

Flight training equipment provider for professional use



https://flightdecksolutions.com/

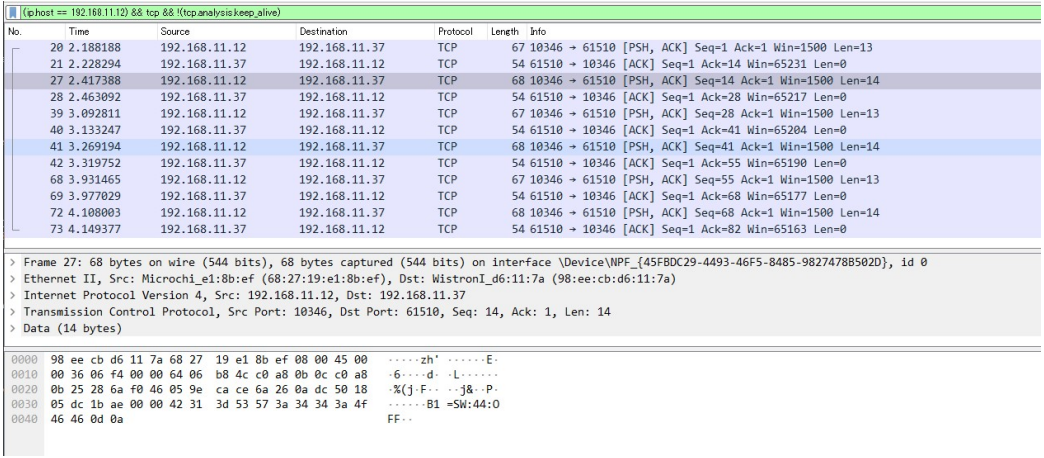
Bundled HW test tool (= interface IT module)



Bundled HW check tool

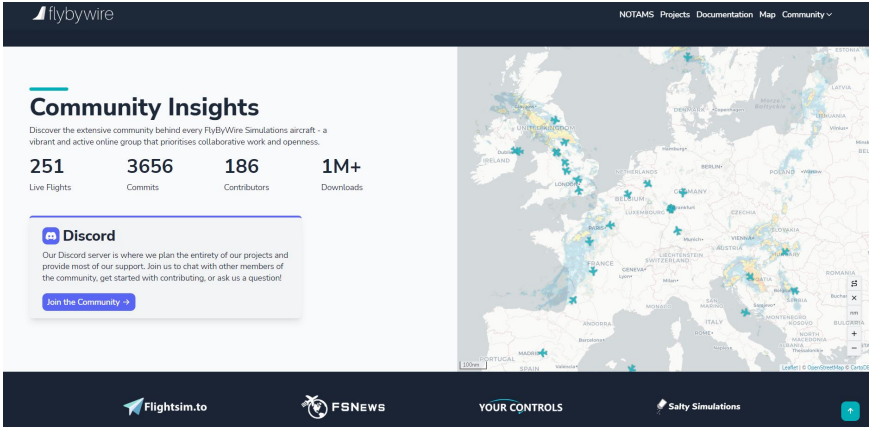
- HW validation tool
- Developed by TEKWork Limited
- Generate TCP/IP packet
- Key input event
  - MCDU to PC (tool)
- Indicator on/off control
  - PC (tool) to MCDU
- MSFS support is not ready

Capture TCP/IP traffic (using Wireshark)



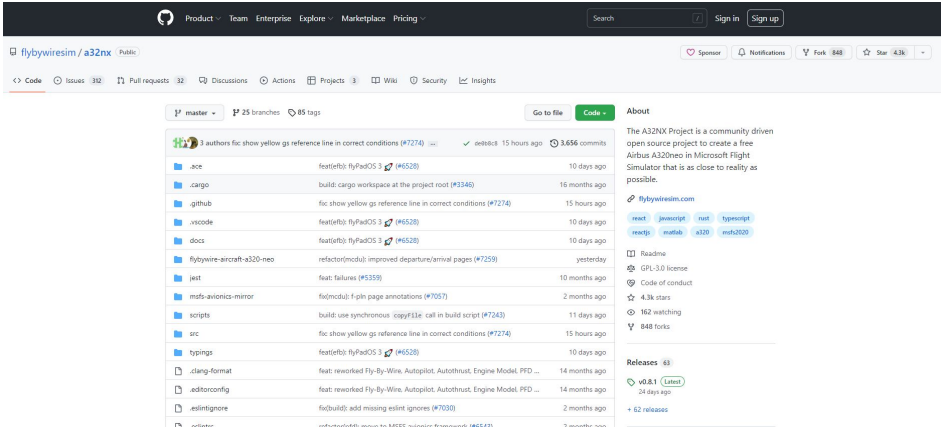
FryByWire Simulations A32NX project

Open Source Project who develops MOD for MSFS



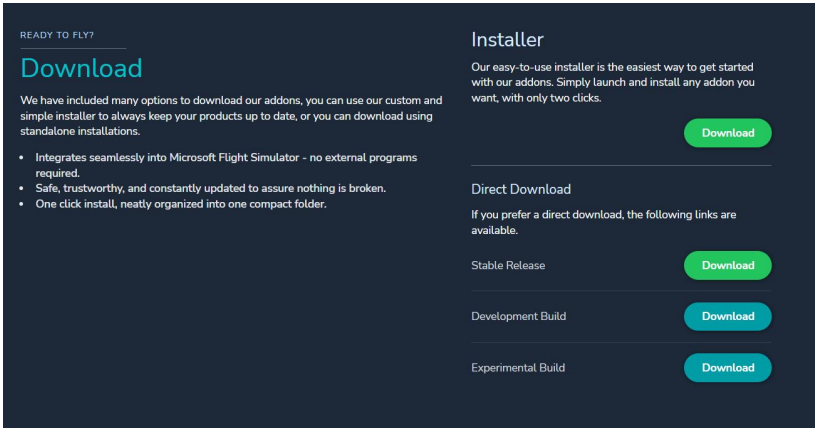
https://flybywiresim.com/

Fully comply with Open Source development model



https://github.com/flybywiresim/a32nx

Rolling release mode (Stable / Development / Experimental)



https://flybywiresim.com/a32nx/

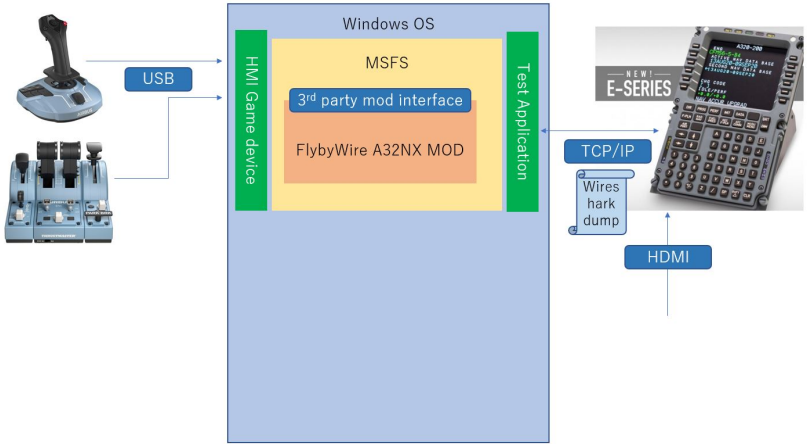
A32NX MOD aims to reproduce precisive reality

https://docs.flybywiresim.com/fbw-a32nx/

A32NX reality includes

- Look & Feel (color, sound,..)
- Physical motion model
- Flight management system
  - FMS algorithm
  - MCDU operations
  - SimBrief flight planner
- integrate real world
  - Weather
  - Routing (via Navigraph)
- Follows every MSFS updates

System Architecture (original)

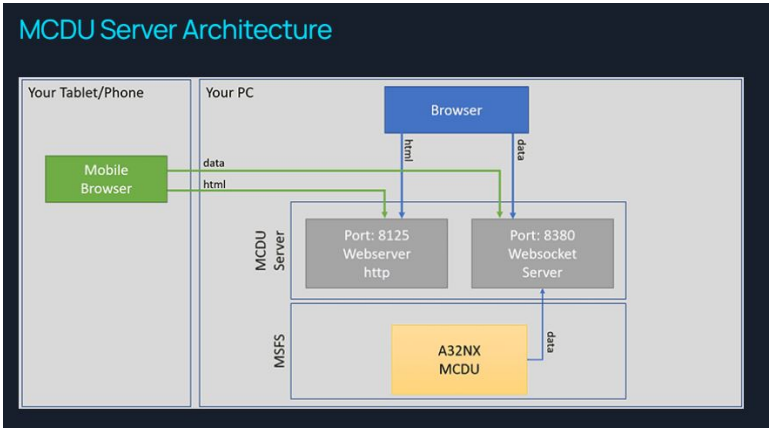


Newly introduced MCDU web interface

MCDU runs as Web application

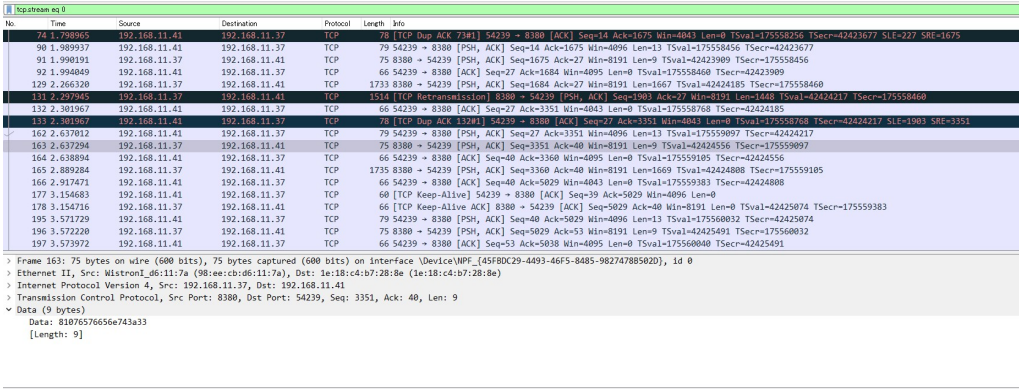
- Can run MCDU on separate tablet, smartphone,..
- Can use real printer
- Runs MCDU-server to interface to MSFS/A32NX MOD
- Use WebSocket protocol
- https://docs.flybywiresim.com/fbw-a32nx/feature-guides/web-mcdu/

MCDU server architecture (Web socket interface)

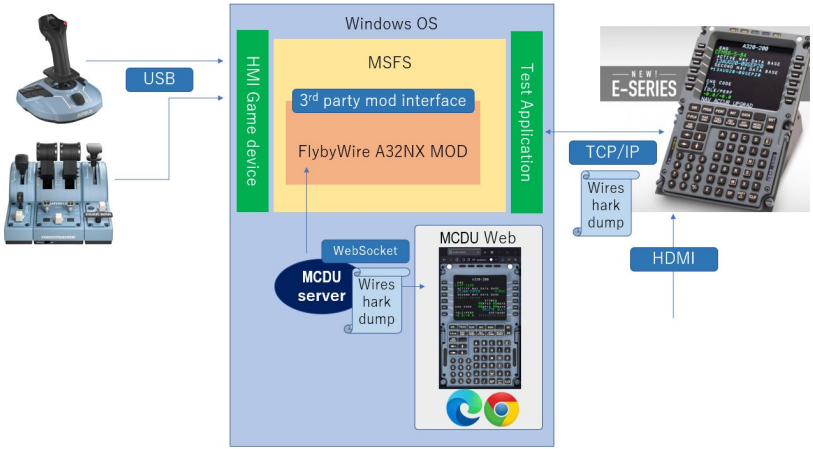


https://docs.flybywiresim.com/fbw-a32nx/feature-guides/web-mcdu/#starting-the-mcdu-serve

Capture the web socket data (using Wireshark)



System Architecture (w/MCDU web interface)



System Architecture (integrated with translator)